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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/512,417	02/24/2000	Klaus Vogler	LMPY-4910	5556

7590

06/19/2002

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EXAMINER

FLORES RUIZ, DELMA R

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 06/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/512,417

Applicant(s)

VOGLER, KLAUS

Examiner

Delma R. Flores Ruiz

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 10-15 is/are rejected.
- 7) ☐ Claim(s) 7-9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.


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Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

The dependence of claim 8 upon claim 9 is confusing because, since claim 8 precedes claim 9, there is insufficient antecedent basis for including the limitations of claim 9 into claim 8. Please clarify.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims rejected under 35 U.S.C. 103(a) as being unpatentable over Ershov et al. (6,381,257 B1) in view of "Diamond -vs- Photodiode; High speed planar photoconductor", Centronic Ltd., Electro optics division, Croydon, CR9 OBG, England, February 2, 1999.

1-15
Regarding claims ~~4-6, 10-15~~, Ershov et al discloses a laser system

comprising; a molecular fluorine (F₂) gain medium disposed in a resonant cavity (Fig. 4 Character 211, abstract, Column 3, lines 50 – 60) a power supply (Fig. 4 Character 220, Column 22, lines 10-47) for exciting the gain medium to produce a laser beam having an ultra violet (UV) radiation output at substantially 157 nm (Column 1, lines 24 – 25, and a red radiation output in a 620 to 760 nm wavelength range, (Column 16, lines 46 – 67, and Column 17, lines 1 – 67) and a photo diamond detector that receiver a portion of the laser beam for measuring at least one optical parameter of the UV radiation; wherein the photo diamond detector is substantially insensitive to the red radiation output in the laser beam. A controls for controlling the power supply, wherein the controller modifies the excitation of the gain medium by the power supply in response to the optical parameter measured (Column 1, lines 32 -37, Column 22, lines 10-47, and Column 8, lines 34 – 39. The laser system comprising a laser tube for containing the gain medium, wherein the gain medium is gaseous (Abstract, Column 1, lines 26 – 67, and Column 2, lines 1 – 67) a controller for controlling the discharge module, wherein the controller modifies the gas added to and withdrawn from the gain medium in the laser tube by the discharge module in response to the optical parameter measured (Column 28, lines 66 – 67 and Column 29, lines 1 – 47). The optical parameter is UV radiation energy output, and the controller operates both the power supply and the discharge module to regulate and stabilize the energy output of the UV radiation in

response to the UV energy output measured (Column 15, lines 10 – 29). The optical parameter is at least one of power level, pulse energy, energy dosage, and pulse waveform (Column 15, lines 10 – 29, (Column 23, lines 65 – 67, and Column 22, lines 10-47, Column 24, lines 1 - 25).

Ershov discloses the claimed invention except for and a photo diamond detector that receiver a portion of the laser beam for measuring at least one optical parameter of the UV radiation; wherein the photo diamond detector is substantially insensitive to the red radiation output in the laser bean. It would have been obvious at the time of applicant's invention, to combine "Diamond –vs- Photodiode; High speed planar photoconductor", Centronic Ltd., Electro optics division, of teaching and a photo diamond detector that receiver a portion of the laser beam for measuring at least one optical parameter of the UV radiation; wherein the photo diamond detector is substantially insensitive to the red radiation output in the laser beam with a laser system because the PD1.4 is solid state deep ultraviolet photo detector fabricated from high synthetic diamond film. The device operates in the photoconductive mode and combines high sensitivity to UV light whit outstanding rejection of visible wavelength. The PD 1.4 is a two terminal device, which relies upon the wide bandgap of diamond, and its consequence intrinsic resistively, to present resistance on the OFF state of $\cong 10G\Omega$. Absorption of light which has energy equal to or greater than the bandgap (≥ 5.5 eV, $\leq 225nm$) results in the photogeneration of carries within the diamond such that the

resistance drops in proportion to the intensity of the illumination applied; this typically yields an ON state in the order of $10\text{M}\Omega$. The device is a light sensitive resistor, so which the resistance is modulated by the intensity of incoming illumination, the current measured through the detector is a function of the applied bias as determined by Ohm's law. Because of the combined effects of carrier trapping in the polycrystalline diamond film and the high electric field breakdown strength of Centronics processed diamond, it is possible to exploit this simple current-voltage relationship to measure each photogenerated carrier more than once multiplication achieving amplification without carrier multiplication; this is described below in "Photoconductivity Gain". The measured spectral responsivity of the PD 1.4 is plotted in the two graphs below. Due to a difference in the active areas of the device, the 130- 250 nm characteristics is plotted with reference to the NIST standard rather than as an absolute value. The solid-state deep UV photoconductor devices, which exhibit high sensitivity in the wavelength range $<130 - 225\text{ nm}$ whilst remaining insensitive to longer (visible) wavelength. The detector is fabricated from high purity synthetic diamond film and is designed to act as an enabling technology for application areas such as excimer laser process control, flame/combustion sensor and high intensity lamp monitoring. Major benefits offered by the Photo diamond sensor include negligible visible response (an inherent property of pure diamond), low voltage operation, low dark current and radiation hardness combined with the physical robustness of one of the hardest materials on earth. The spectral response of these detectors makes them ideal both for stand-alone use at short

wavelength and a complementary sensor solution for broadband application alongside SiC and Si photodiode. One of ordinary skill in the art would have recognized that the method as claimed is implicitly stated over the description of the apparatus disclosed above.

Allowable Subject Matter


Claims 7 – 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 7 – 9 has been allowed over the prior art because they fail to teach a laser system a beam splitter disposed in the laser beam splitter disposed in the laser beam to deflect the portion of the laser beam toward the photo diode detector and a scattering plate disposed in the portion of the laser beam deflected by the beam splitter for diffusion the laser beam portion measured by the photo diamond detector, the metal mesh shielding disposed at a front face of the photo diamond detector for preventing EMI disturbance to the photo diamond detector and has different mesh wire densities to adjust transmitted energy to the photo diamond detector.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Delma R. Flores Ruiz whose telephone number is (703) 308-6238. The examiner can normally be reached on M - F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-3431.


Delma R. Flores Ruiz
Examiner
Art Unit 2828


Paul Ip
Supervisor Patent Examiner
Art Unit 2828

DRFR/PI
June 14, 2002